THE

VETERINARY JOURNAL

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Editorial.

THE NATIONAL VETERINARY ASSOCIATION.

THE fact, as published in a recent issue of *The Veterinary Record*, that up to the present only 824 members of the profession, out of a total of 3,320, have "joined up" does not say much for our *esprit de corps*, and that only about 60 per cent. take the trouble to read the weekly organ of the profession shows a lack of interest which is regrettable.

We are indeed slow to realise the value of acting up to our motto, "*Vis unita fortior*," and those who grumble most because our just rights are not given to us are, as a rule, those who have helped the least. If only every man would join the Association *and give it his whole-hearted support* we could, if we held together, get all our just dues. All public appointments connected with the inspection of animals, alive or dead, should be under our control; the salaries offered to our whole-time Government and other appointments should be on a scale which would be an adequate recompense for the services of educated and specially trained professional men: our colleges

and teaching institutions should be adequately supported morally and financially ; and all matters which we bring forward before Parliament or any Government body would have sufficient weight behind them to enforce serious consideration.

All these things can be brought about by proper and loyal combination, and the National Veterinary Association can, if only we support it whole-heartedly and with absolute loyalty, be converted from an effete and insignificant body, without union and without power, into a live and powerful organisation ; able to dictate, and even to command, in the name of the profession, its rights and dues ; second only to the Council of the Royal College, who would, on occasion, be only too glad to have such a powerful driving force at its back.

The profession, as a body, was ever apathetic ; it is still much too apathetic ; and those who have tried to raise its enthusiasm know this full well. The present Secretary has made superhuman efforts to make the Association what it should be, and *The Veterinary Record* a paper worthy of the profession, but a membership of only 824 out of a possible 3,320, and a subscribers' list to the weekly paper of only 1,803, shows a lack of intelligent interest which is lamentable, and which can only be remedied by our own selves.

RESEARCH SCHOLARSHIPS IN AGRICULTURAL AND VETERINARY SCIENCE.

Too much publicity cannot be given to any chances offered to our graduates for research work, and attention is again called to the announcement, published in our last issue, of the Ministry of Agriculture and Fisheries, who invite applications for Research Scholarships in Agricultural and Veterinary Science. These are to take the form of scholarships tenable for two years, and are each of the value of £200 per annum. The number awarded in the present year will not exceed five, and nominations must be sent in before July 15. The prescribed form can be obtained on application from the Secretary, Ministry of Agriculture and Fisheries, 4, Whitehall Place, S.W. The profession is very poor in chances of this kind, and, although at the present value of money the amount of the scholarships is not great, they afford opportunities to our young graduates which should be gripped with both hands, as being the foundation of future scientific edifices for the profession and for themselves. There are many of the older members of the profession who look back with retrospective ideas of what godsends such opportunities would have been in their younger days, and we shall be foolish if we do not take them now they have arrived.

THE OLD HORSE TRAFFIC.

ALTHOUGH the "decrepit" horse traffic is a thing of the past, and much has been done to ameliorate the condition of the animals sent over the Channel for butchery purposes, there are still many points which need the consideration of the Government, and which have given rise to an outburst of justifiable indignation on the part of the general public with a view to prohibiting the traffic altogether. It is not merely a question of sentimentality, and there are two points in particular on which we, as practical veterinarians, can absolutely join issue. One is the method of killing, and the other is the question of risk of injury on the voyage. The lover of horses does not mind his animals being killed, so long as this is done in the most humane manner possible, but the hammer and the knife are not always painless or instantaneous. One has not to wait long in a horse abattoir on the Continent, where either pithing or stabbing to the heart is the method used, to see sights which excite pity and indignation; and where the hammer is used the sight, too, is revolting, especially when it does not produce unconsciousness at the first blow. It all seems so unnecessary, when a humane killer is available at a very small cost and death by its use is instantaneous and absolutely painless. There is no reason why it should not be used, as in England, and if we are unable to enforce a regulation to this effect the horses intended for meat must be killed on this side. This, too, would do away with the risk of injury on the voyage, and French and Belgian inspectors can inspect the meat before export.

The Ministry of Agriculture have the matter at the present time under consideration, as also the conveyance of horses by railway, and it is to be hoped that each will presently be satisfactorily amended. Their weekly report, herewith appended, discusses each subject fairly and squarely. Let us hope that some satisfactory action will at once be taken.

THE EXPORT OF HORSES.

The export of horses for slaughter on the Continent, almost exclusively in Belgium, Holland and France, is regulated under the provisions of the Diseases of Animals Act, 1910, and the Exportation of Horses Act of 1914. Thereby no horse can be exported without a licence showing that it has been examined by a veterinary surgeon appointed by the Ministry of Agriculture, who must certify that the horse is "fit to travel and to work."

The attack that has been made upon the traffic with so much vigour and feeling is directed to two points: (1) That unfit horses are shipped; (2) that the horses are subjected to much suffering on the other side

before they are killed, in that they are moved by road without food to the place of slaughter, and are brutally and cruelly handled.

It is admitted that a sufficiently high standard in the horses allowed to be exported has not always been enforced in certain northern ports. The difficulty of administration lies in the fact that the standard of what can be considered fit to travel and work is a matter of judgment; large numbers of horses have to be examined under conditions which are not always of the best. Undoubtedly, too, a part at least of this trade is in the hands of men who are not too scrupulous in the methods they adopt to get horses passed by the inspectors.

As regards the second point, it is impossible for the authorities in this country to exercise any control over or impose any conditions on the people who handle the horses after landing on the Continent.

It is clear that the agitation in this country is directed against the trade itself, and will not be satisfied by anything less than the cessation of the trade. However carefully examination on this side is conducted there will always be differences of opinion as to what constitutes fitness to work. Several observers in the countries concerned have reported that horses which would not be passed for export may be seen there at regular work. Moreover, and this is a point that those who are interesting themselves in this question overlook frequently, the main allegations of cruelty and suffering are directed against happenings outside this country.

It should be remembered, too, that the United Kingdom has a considerable and valuable export trade in horses, which is altogether apart from the traffic in worn-out horses for slaughter. These animals consist of blood stock for the improvement of the Continental breeds, harness and riding horses, of Army remounts, and to a certain extent of work horses which are past their prime, but have some years of useful work in them. It was not the intention of the Legislature to interfere with this trade, and the measures which are meant to put a stop to the traffic in live horses for slaughter, as distinct from meat, should not be allowed to make a legitimate trade unworkable.

Three methods have been suggested for putting an end to the trade: (1) Imposition of a licensing fee of £20, something that would render the trade impossible; (2) the imposition of an age limit on the horses exported; (3) the prohibition of export of horses below a certain declared value. The last proposition would undoubtedly be rendered unworkable by collusion between the dealers on either side.

As regards the first proposition, it has never been customary in this country to impose licensing fees that would, in effect, be export taxes, and would seriously handicap the legitimate export trade in horses for work or breeding. The proposal for an age limit is equally

open to objection. A higher limit than seven or eight years cannot be fixed because, above that point, it becomes impossible to diagnose a horse's age. The teeth enable one to say that the horse has not yet reached an age approximately seven or eight, but would not enable anyone to certify that the horse is above or below an age like 12 or 14 years. The legitimate trade does export horses above eight years of age, and, again, some young horses are exported for slaughter only, so that an age limit would satisfy neither of the required criteria.

The object to aim at is that horses intended for food should be slaughtered on this side and exported as dead meat. The French Government are already doing this, and negotiations are in progress with the Dutch and Belgian Governments to the same end.

It may be said quite plainly that unless the export trade to Holland and Belgium can be changed from a trade in the live animal to a trade in the dead meat the Ministry of Agriculture will be driven to consider further legislation. All horses required by the Continental butcher should be slaughtered humanely on this side of the Channel, and unless the Dutch and Belgian Authorities can be persuaded to offer the necessary facilities for the development of the trade on these new and human lines, no consideration of private profits ought to restrain the Ministry from taking the necessary steps to see that the trade as carried on at present is either ended or made so difficult and unprofitable that few will care to take any part in it. At present the traffic in horses for slaughter is permitted by law, but it is clear that a growing public opinion in this country will not tolerate the continuance of the trade as it now exists even under the strictest observance of the regulations. Either the traders in conjunction with the Government concerned will have to alter their methods and conduct the business as a dead meat trade, or the Ministry will be forced to ask for powers that will stop the trade entirely.—*Ministry of Agriculture and Fisheries.*

EXPORTATION OF HORSES AND CONVEYANCE OF HORSES BY RAILWAY.

THE Diseases of Animals Act, 1910, as amended by the Exportation of Horses Act, 1914, prohibits the shipment of any horse, ass or mule from any port in Great Britain to the Continent of Europe unless the animal has been examined immediately before shipment by a veterinary inspector appointed by the Ministry and certified by him to be capable of being conveyed and disembarked without cruelty, and also to be capable of being worked without suffering on arrival at its destination on the Continent. Provision has been made by the Ministry for the veterinary inspection of horses shipped under the

above-mentioned Acts at the ports of London, Harwich, Hull, Goole, Folkestone, Southampton, Leith, Grimsby and Newhaven.

As it is of great importance that any illegal traffic in worn-out horses should on humanitarian grounds be prevented, the Ministry has asked local authorities of seaboard districts to co-operate with the officers of Customs and Excise at the ports, with a view to prevent shipments of such horses contrary to the Acts, and the Board of Customs and Excise have agreed to assist by instructing their officers to notify to the Ministry and also to local authorities any case in which it appears to them that the Acts are being contravened. This will enable action to be taken by the local authorities either to prevent illegal shipments taking place, or to take legal proceedings against those found guilty of an infringement of the Acts.

The Ministry has further called the attention of all local authorities to the provisions of Articles 3, 4, 8 and 9 of the Horses (Importation and Transit) Order of 1913, which prohibit the carriage by water or by railway of any horse, ass or mule which, owing to infirmity, illness, injury, fatigue or any other cause, cannot be carried without unnecessary suffering during the intended transit.

Copies of a poster warning horse dealers and exporters of the requirements of the law in this matter can be obtained on application to the Ministry, 10, Whitehall Place, London, S.W.1.—*Ministry of Agriculture and Fisheries.*

General Articles.

THE HUMANE SLAUGHTER OF ANIMALS.

By GEORGE E. BODY,
Meat and Foods Inspector, Torquay.

THE following are the results of an investigation and extracts from a report presented to the Torquay Town Council relative to the slaughter of animals by humane methods, *i.e.*, the R.S.P.C.S. Killer, the Swedish Killer and the Safeti Pistol.

The investigations were not carried out for, or on behalf of, any society or persons interested in humane slaughtering, but with a view of ascertaining the effects, if any, especially in smaller animals, that shooting with the Safeti pistol would have on the bleeding, setting and keeping qualities of the meat.

The animals slaughtered were not selected for the purpose, but were taken in the ordinary course of slaughtering at the private and public slaughtering establishments in the borough.

In a number of cases the slaughtermen carried out the shooting, and those animals not shot were pole-axed and stuck by the slaughter-

men, the blood being caught in vessels similar in every way as if intended for commercial purposes.

METHODS OF SLAUGHTERING.

There are two methods of slaughtering food animals in general use. Pole-axing in the case of bullocks and sticking in the case of sheep, pigs and calves. These methods in the hands of experts are efficiently and expeditiously carried out, although even in the hands of the expert the killing of the small animals from the humanitarian point of view leaves much to be desired.

There are two principles which must be kept in mind in dealing with this problem. First, to kill the animal in such a way that death occurs with the least possible delay, so as to prevent cruelty by pain. Secondly, that the animal must be killed in such a manner that the keeping qualities of the meat are not impaired or organs or parts so damaged as to depreciate their value as a commercial article of food.

The keeping quality of the meat is a very important matter, not only to the butcher, but equally so to the consumer. The mode of slaughter, assuming the animal is a healthy one, has great bearing on the matter, as the greater the amount of blood left in the carcase, the more rapidly does decomposition set in, as blood putrifies much quicker than muscular tissue, or, in other words, micro-organisms will multiply much more quickly in meat containing an excess of moisture than in meat dry or well bled. This may be noticed in rabbits and game, which are not bled at the time of slaughter.

POLE-AXING OR STUNNING.

This method of killing cattle has been in vogue from time immemorial; generation after generation of butchers have used it, so that the custom nas become so fully established that new methods are either treated with ridicule or contempt. Where this has failed the argument is raised that shot animals do not bleed so well and the flesh decomposes much more rapidly than those stunned by the pole-axe.

The same argument is used in connection with sheep, calves and pigs, great stress being laid on the point that, owing to hæmorrhage round the brain and a slight breaking up of a small portion of the brain substance, its keeping qualities and blood stained appearance depreciate its value. Admitting that the brain of a shot animal is more bloodstained than the brain of one stuck, it is only a matter of appearance. This, and the extra trouble involved in preparing it for food, is the most that can be said against it. If the brains of all animals were in a similar condition the purchaser, after a few months, would become so accustomed to their condition that no comments would be made.

Years ago it was the custom in many parts of the country to slaughter calves by suspending them by the hind legs and opening a blood vessel in the neck and allow them to gradually bleed to death. Of course, when the authorities stepped in and put a stop to this cruel method of slaughter, the butcher was up in arms at once, his contention being that any other method of slaughter would prevent thorough bleeding and that the flesh would be dark and fail to keep. But how many butchers of to-day would defend such a procedure, or could one be found who, on his affidavit, would say that customers complain that the veal is much darker in colour than formerly.

The objection raised in the shooting of calves is the presence of a small hole in the centre of the head, thus somewhat spoiling its appearance for the table. If people are so fastidious as to object to this, they deserve to be deprived of the luxury of calves head, or even sheep's head, whatever the mode of slaughter.

As regards pigs slaughtered by these mechanical instruments, the complaint is made that spots of blood appear in the region of the spine from the neck downwards ; that the flesh in the region of the neck is much darker than normal ; that the carcase fails to set firmly, and that its general appearance is unsatisfactory.

I can only say that such conditions have never been observed by me, either in pigs killed with the Captive Bolt Pistol or the Creener " Safeti."

Coming to the reliability of these instruments, Mr. Paddison states : " The Meat Inspector at Reading, in a letter to the *Belfast News Letter*, states that the R.S.P.C.A. Killer has been used on 2,000 animals for the Government without failure. The manager of the abattoir at Weston-super-Mare, referring to the use of the same type of killer on thousands of animals during the past five years, says : " I have still to record the first failure in its use."

The Head Slaughterman at the Government Slaughter House at Southampton, referring to the shooting of several thousands of sheep by the Greener " Safeti " Killer, states that the instrument has never failed. An equally satisfactory experience has resulted from the use for several months of the " Speary " Killer on sheep at the slaughter house of the Mid-Gloucestershire Farmers' Union, and Miss V. Wood, of the Council of Justice to Animals, informs me that : " At Wellington they kill 500 pigs a week with the Greener, and at Bath a firm kill all their pigs, large as well as small, with it, while another firm have killed over 15,000 with it."

Going further afield I find that mechanical appliances somewhat similar to those suggested here are in daily use in the public abattoirs on the Continent, and in the Kingdom of Saxony regulations made

on March 21, 1892, prescribe that in the slaughtering of all animals stunning must precede the removal of the blood. In this State the choice of a stunning apparatus is left to the discretion of the butchers, although the wooden hammer is recommended for calves, the bolt apparatus for pigs, and the striking bolt hammer or a blunt axe for sheep.

Similar regulations dated as long ago as May 23, 1891, are in force in the Duchy of Meiningen.

Considering the length of time and the number of establishments in which these mechanical instruments have been in daily use (the R.S.P.C.A. alone have sold over 5,000 of their special type of Humane Killer), their efficiency has been proved beyond doubt, and in view of the investigations that have been made by qualified medical experts, meat inspectors and practical butchers, it has been proved conclusively that the bleeding, setting and keeping qualities of the carcase are not in any way impaired.

In comparing the two methods of slaughter, old and new, it is necessary so as to obtain a clear idea of the process that the operation should be described.

Pole-axing.

A bullock, being a large animal and fairly powerful, has to be rendered harmless as quickly as possible, therefore the pole-axe was found, up to the time of the invention of mechanical killers, to be the quickest and safest method of doing this. The almost universal procedure is to pass a rope round the neck and horns of the animal, passing the rope either through an iron ring fixed in the floor or wall or through a hole in a wooden post fixed in the floor or wall. The head is then placed in such a position that the slaughterman, by an overhead stroke, can bring the pole-axe down with considerable force. The pole-axe, being provided with an iron spike, penetrates the head of the animal, injuring the brain and rendering the animal unconscious. A cane is then inserted in the hole made by the pole-axe (termed "Pithing"), which breaks up the connection between the brain and the spinal cord, destroying the nerve centres and preventing risk of the animal rising again. The animal is then bled by thrusting a knife in the throat, when the large blood vessels in the neck are severed, thus leading to the draining of the carcase and organs of blood.

This method of slaughter, when carried out by a skilful man, is practically painless, as the blow of the axe at once renders the animal unconscious, but in the unskilled or for want of strength on the part of the slaughterman, several blows with the axe are often necessary before the animal is felled. In fact, I have seen animals with an eye knocked out owing to bad aiming, and I have also seen animals felled

and rise again and clear the slaughter-house of the workers, when a gun has had to be obtained and an opportunity awaited to shoot the animal.

But in slaughtering with one of the Humane Killers the risk of failure to thoroughly stun the animal, or inaccuracy of aim, is reduced to a minimum, as the instrument is placed directly in the centre of the head so that, when fired, the bullet cannot fail to enter a vital part of the brain, causing violent concussion of the brain and instantaneous unconsciousness.

In the slaughtering of sheep the common method is, without any attempt at stunning, to sever the blood vessels in the neck and let the animals bleed to death, unconsciousness only appearing when the brain is deprived of blood (cerebral anæmia).

Now, consider the difference in the case of the animal stunned prior to sticking. The muzzle of the pistol is placed on the animal's head over the brain and the trigger pulled; the cartridge is at once discharged; the bullet smashes through the bone covering the brain, causing violent concussion and instantaneous unconsciousness, and all pain associated with sticking is eliminated. Pithing is unnecessary, consequently the vital centres are not damaged, therefore bleeding is more thorough. This is well shown in the case of the liver and lungs, as the capillaries of these organs are invariably found to contain less blood.

Pigs are slaughtered by thrusting a knife in the underside of the throat and severing the large blood vessels of the neck, when the animal bleeds to death. Owing to the thickness of the skin or folds of fat, it is frequently found necessary to cut the skin before thrusting the knife into the throat.

The method of slaughtering calves is to tie strong cord round either one or both hind legs and to hoist them clear of the ground by means of a rope and pulley. The animal is then pithed by thrusting a knife in the back of the neck between the atlas and occipital bone, thus severing the spinal cord, afterwards cutting the throat in the same manner as with sheep and allowing the animal to bleed to death.

This method of slaughter is a gruesome sight to watch, for unless the pithing and sticking are expeditiously and skilfully done, some little time elapses before the animal dies, during which period it frequently moans and shows evidence of being in pain. Needless, but of course, quite unintentional, pain is caused if a sharp-pointed knife is not used or if the operator is not skilled at the work, or if from some cause the rope breaks or slips from the legs after the animal is raised from the ground.

In my opinion the dagger-pointed knife is preferable to the one usually employed, but men object to them on account of the risk of missing the spinal cord owing to the width between the last bone of the spine and first bone of the head. This, to my mind, shows that this method of slaughter is not the best or simplest way of killing the animal.

"In the Government districts of Gumbinnen and Dusseldorf the killing of cattle by pithing is forbidden, and the same is true—or was—previous to the war for the whole Russian Empire, in which it was previously the exclusive method of slaughter. The abandonment of pithing as a method of slaughtering in Russia was chiefly brought about by the experiments of Dembo, who showed that pithed steers still ate salt and bread which was offered them." (Dr. Ostertag.)

RESULT OF INVESTIGATION CARRIED OUT AT TORQUAY.

CATTLE.

Two cows and two bullocks were slaughtered by the Swedish humane killer. These animals were not selected for the purpose, nor were previous arrangements made, but were killed by this method as the opportunity permitted.

15/2/21. *Bullock No.* 1. The shooting was carried out by the slaughterman at the abattoir, who had never before seen or used this particular instrument. The animal was promptly and efficiently stunned, falling with fore legs extended and hind legs flexed. The animal was not pithed, such not being necessary. The animal bled freely, but the blood was slightly darker than in a pole-axed animal.

21/2/21. *Cow No.* 2. The instrument was lent to a butcher for testing. On enquiring the result he said: "Everything was alright."

23/2/21. *Cow No.* 3. Animal between six and eight years old. The animal was promptly and efficiently stunned, falling with fore legs extended and hind legs flexed. On placing the finger on the eyeball no flickering occurred, thus showing the animal was quite unconscious. A little time elapsed from the moment of sticking to the commencement of bleeding, owing to oversticking, but the animal bled well. A sample of blood, approximately 2 gallons, was obtained and set aside to allow the serum to settle. The blood appeared slightly dark. The animal was not pithed.

An examination of the brain showed that the bullet entered the brain about ¾ in. from the tip of lobe near nose, embedding itself in the base of the brain cavity. Hæmorrhage was present over an area of about 1½ ins. where bullet entered, and a little blood was found in the base of the brain cavity.

All organs and carcases were normal except for a large clot of blood in the chest cavity, due to oversticking.

24/2/21. *Bullock No.* 4. Animal about three years old. I was too late to see this animal shot, but the slaughterman informed me he failed to see any difference in bleeding or position in which animal fell. Everything appeared similar to one pole-axed, but if anything the animal bled more freely.

I examined the carcase and organs about half-an-hour after slaughter, when everything appeared normal, except on cutting the liver coagulated blood was not present in the capillaries.

APPEARANCE OF THE CARCASE.

Cow No. 3. An examination of the carcase after 28 hours showed it to be well set and normal in colour, and an examination of the parts of the carcase after 48 hours revealed no change in the muscular tissues, and a fore quarter after six days showed that it had not deteriorated in any way, and was perfectly firm to the touch.

Bullock No. 4. Part of the carcase of this animal, when exposed for sale in the shop 20 hours after slaughter, I failed to select from parts of a pole-axed animal.

EXAMINATION OF THE BLOOD.

The blood from *Cow No.* 3 clotted rapidly and normally, one quart of serum being obtained from nearly two gallons of blood. The serum was pink in colour, whereas serum from pole-axed animals is generally straw colour, but this depends to a great extent as to how the blood is caught in the storage vessel.

PIGS.

28/2/21. One pig was shot by the Greener "Safeti" pistol, as used for stunning sheep.

The animal was promptly and efficiently stunned, falling at once with legs flexed. It was stuck about 40 seconds after falling. Muscular movement was more persistent than in the case of sheep, but all movement ceased about two minutes after shooting. The animal bled well, and the blood appeared normal in colour.

I examined the carcase about three hours after slaughter. It was well set and perfectly normal in appearance; the internal fat and fat on the back was not discoloured. (Extravasion of the blood in patches.) Post-mortem examination of the head revealed the presence of hæmorrhage between the skin and the bone of the skull at the point where the bullet entered. The brain substance was practically uninjured, only the tip of the fore part of the organ being damaged. There was slight hæmorrhage at this point between the membrane and brain tissue, and a small accumulation of blood in the cavity forward of the medulla. The spinal cord, chine and muscular tissue of the neck were absolutely free of blood, a condition exactly opposite to that alleged by some butchers.

An examination of parts of the carcase when exposed for sale in the shop 28 hours after slaughter appeared in every way similar to an animal stuck by the old method of slaughter.

SHEEP.

26/2/21. *Sheep No.* 1. Killed by "Safeti" pistol. The eyes closed immediately after shooting. The animal struggled, but not so persistently as animals "stuck." Blood was bright red in colour, and appeared to bleed better than in sticking. Sample of blood retained. This was examined on Sunday afternoon, about 30 hours after drawing, when 8 ozs. of serum was obtained, apparently a normal quantity.

Remarks.—Brain. Hæmorrhage round brain about 1¼ ins. in area; small quantity of blood in brain cavity; brain not broken up as shot entered about ½ in. from top of lobe at base of forehead. No blood in neck or spinal column. The liver on being cut was found to contain less blood in the capillaries than in the animal that was stuck at the same time.

Wednesday, 2/3/21. Cow shot by "Swedish" killer. The animal was at once stunned, being rendered unconscious instantly. It bled freely and the blood was normal in colour. The brain was in no way damaged, the amount of hæmorrhage being little more than in one pole-axed. The carcase and all internal organs were perfectly normal.

The carcase after 24 hours had "set" well, and showed no appearance of blood staining.

Three sheep were shot with the "Safeti" pistol at the same time and one was stuck. Apart from the presence of a very small hole in the skull where bullet entered there was nothing to distinguish the shot from the stuck carcase. After removal of the heads, when carcases were exposed for sale in the shop, it was impossible to say which had been shot or stuck.

I removed the brain from one of the shot animals and found the membrane in the vicinity of the bullet hole slightly bloodstained, but the lobes were not broken up. The bloodstained membrane was easily removed after soaking in salt water, and on being cooked no odour or taste of gunpowder could be detected.

Wednesday, 2/3/21. A pig of about 10 score was shot with the "Safeti" pistol, two shots being fired, but both proved insufficient to stun the animal, consequently it had to be stuck.

An examination of the head showed that the bullet had penetrated the skull, but not the layer of bone covering the brain. Apparently this type of bullet is too soft and the explosive not powerful enough to propel it through the hard layer of bone of a pig of the age and weight experimented upon. The point at which bullet entered the

head would have penetrated the lower part of the brain if the bone had been softer or thinner, so there was no doubt as to the accuracy of the aim.

It was subsequently found that the cartridge used for this test was not of the correct type. A cartridge supplied with a higher explosive power and larger bullet should have been used.

Wednesday, 2/3/21. One calf was shot by the " Safeti " pistol, which proved very effective. Animal bled and " set " well.

Thursday, 3/3/21. Eight sheep were shot by the " Safeti " pistol. These animals bled well, but the blood which flowed from three of them after sticking was dark in colour, while the blood from the other five was of a bright red colour. All animals were killed within half an hour, all having been kept in the same pen. The carcases " set " well, and there were no complaints as to their condition.

CONVULSIONS.

The daily press recently gave an extract of a lecture delivered by Sir A. Wright, who is a pathologist of some repute, wherein he states " that he had been informed that the pistol was unsatisfactory, because the flesh of animals killed by this weapon decomposed rapidly, whereas animals that were pole-axed remained fresh much longer. The explanation of this difference is to be found in the fact that animals shot through the head by a pistol fall down in convulsion, while such convulsions are absent after the use of the pole-axe. These convulsions cause the flesh to become acid, and the acidity hastens decomposition."

Although Sir Almroth does not say so in so many words, his statement leaves the impression that the muscular tissue of a pole-axed animal has an alkaline reaction, and that of a shot animal an acid reaction ; the inference that shooting with one of these humane killers brings about the latter condition owing, apparently, to the animal dying in convulsions.

Evidently Sir Almroth has not personally investigated the matter, otherwise he would have ascertained that, so long as the animal was in good health and a normal condition, *i.e.*, not suffering from the effects of a fatiguing journey or terrified or excited, neither shooting or pole-axing affects the reaction of the muscular tissues.

The investigations carried out by me have shown that muscular tissue immediately after death has an alkaline reaction, but as rigor mortis sets in, or what the butcher calls " setting," the muscle has an acid reaction. This condition remains in both shot and pole-axed animals until about the sixth day. Weather conditions have, of course, some bearing on the matter.

Take one case in point, which is only one of many tested during the past three months, all with the same result. Two animals, one

a cow, the other a bullock, were slaughtered on May 9, the former being shot with the R.S.P.C.A. killer and the latter pole-axed. On the 11th to the 14th the tissue of each animal had an acid reaction and on the 16th a neutral reaction. As the remainder of the carcases were sold that day for consumption the test could not be carried further.

These tests are consistent with all text-books dealing with the subject.

Halliburton states :—" The cause of rigor is the coagulation of the muscle plasma. This coagulation results in the formation of myosin, and is gradual in onset. Simultaneously the muscles (*a*) become shortened and opaque, (*b*) heat is evolved, (*c*) they give off carbonic acid, and (*d*) become acid in reaction ; this is due in part to the formation of sarcolactic acid and in part to the formation of acid phosphate."

Smith (" Veterinary Physiology ") states :—" The muscles become firm and solid . . . further, it loses its alkaline reaction, and in course of time becomes acid owing to the formation of lactic and other acids."

" The rapidity with which rigor mortis sets in differs according to the mode of death. If an animal in perfect health be destroyed the muscle stiffening is slow to set in and very persistent ; where death is produced by debilitating disease, or in cases where severe muscular exhaustion has preceded death, the rigor mortis may occur so suddenly and pass off so rapidly as occasionally to escape observation, and decomposition also sets in early."

Ostertag writes :—" The reaction of the musculature during life is neutral, but becomes acid (sarcolactic acid and volatile fatty acids) soon after death. . . . The presence of acid causes the beginning of rigor mortis. The increase of acid contents, however, brings about a cessation of this condition under the influence of putrefactive bacteria, the acid reaction of the musculature gradually becomes alkaline (presence of ammonia)."

One could quote many other authorities on the subject, but all give the same results.

The other statement attributed to Sir Almroth Wright that animals shot die in convulsions is somewhat difficult to follow, as it leaves one to assume that pole-axed animals are not so affected, so is a condition peculiar to and characteristic of death by shooting. Unfortunately Sir Almroth does not enlighten us as to the foundation on which he enacts his theory unless it arose from a perusal of the Belfast Report, where it is stated that shot animals fell with " legs firmly flexed," while pole-axed animals fell with " legs extended."

The firmly flexed legs, we must assume, arose from a violently involuntary muscular contraction, a spasm or convulsion, a condition in which the animals were supposed to die.

From my personal observations I can firmly say that this contraction or bending of the legs is not peculiar to shot animals at all, but occurs just as frequently in animals pole-axed, and is caused, in my opinion, by the injury of a certain part of the brain and irrespective of the actual instrument used. Whether the pole-axe or ball cartridge is used the animal is rendered unconscious by penetration or injury to the brain, followed by hæmorrhage in the brain. The animal, if effectually stunned, whether shot or pole-axed, does not move until pithed or the blood vessels of the neck are severed, then muscular reaction takes place more or less violently until bleeding ceases. The violence or extent of this muscular reaction depends, in my opinion, more upon the idiosyncrasy of the animal than the method of slaughter.

But to say that a shot animal dies in convulsions is not justified by experience. The general muscular spasms are merely reflex contractions. Animals that have been overdriven or badly injured owing to unskilled use of the pole-axe, creating terror or emotional stress, a state of affairs I have occasionally seen, may die in convulsions, but never with shooting, whether it be a humane pistol or shot gun.

(*To be continued.*)

RICKETS AND VITAMINS.

In the April number of the *British Journal of Experimental Pathology* Professor D. Noël Paton and Mr. A. Watson, after a brief recapitulation of their previous work on the subject, give a detailed account of further experimental investigations into the ætiology of rickets in pups. They use throughout pups from the same litters for comparative tests, as, in their opinion, the susceptibility of different strains is so varied as to invalidate statistics collected except on this principle.

The object of the first of the new series of experiments recorded has been to test the possibility of rearing dogs free from rickets, when confined in a laboratory, on diets : (1) rich in milk-fats, and (2) poor in fats supposed to contain an anti-rachitic factor. Both sets of pups developed rickets, but those on an abundant diet less rapidly. In order to ascertain whether this delay could be attributed to a decrease in susceptibility due to more ample energy intake, apart from the influence of any accessory food factor associated with milk-fat, a second series of experiments was undertaken. Pups from three litters were divided into four classes, in each of which the energy intake was kept ample throughout the whole period of growth mainly from one of the following sources : (A) Whole fresh milk and bread

(2 pups); (B) whole dried milk and bread (3 pups); (C) separated milk, bread and lard (4 pups); (D) separated milk and bread (9 pups). Two of the pups in Class D were kept in a large kennel with an open yard, and were freely exercised every day; and in order to try and hasten the onset of rickets two others, also in Class D, were kept in a rabbit hutch from the age of 12 weeks to the age of 16 weeks. The rest were kept in a laboratory, a large sunny room with a concrete floor, in movable pens measuring 5½ feet square. Very special precautions were taken to ensure cleanliness. Of these pups, one, in Class B, died at the end of the ninth week of the diet, not from rickets. One only, in Class D, of the remainder developed rickets. The conclusions drawn from these experiments by the authors are as follows :—

(1) In young dogs under ordinary laboratory conditions a liberal allowance of milk-fat, up to even 14 g. daily per kilo of body-weight, does not prevent the onset of rickets.

(2) Pups kept largely in the open air may escape the development of rickets on an intake of less than 1 g. of milk-fat per kilo of body-weight.

(3) With scrupulous care as to cleanliness it is, at least sometimes, possible to rear pups free of rickets in the laboratory on an intake of only about 0·5 g. of milk-fat per kilo of body-weight, along with bread, provided that the diet affords an adequate supply of energy.

(4) The energy value of the diet, however supplied, quite apart from the presence of any hypothetical anti-rachitic factor in milk-fat, would seem to play a part in controlling the development of rickets; but that it is only a contributory part is shown by the development of rickets in pups with a high energy intake if confined in the laboratory without scrupulous care as to cleanliness.

(5) Milk-fat may be reduced to about 0·3 g. per kilo of body-weight, if its place is taken by an equal amount of lard, without the onset of rickets.

(6) The results of these observations give no support to the conclusion of the Accessory Food Factors Committee of the Medical Research Council that rickets is a deficiency disease due to a lack of an anti-rachitic factor in the diet.

Much work on accessory food factors has been done since the publication in 1919 of the report referred to. With more knowledge distinctions have become less absolute. For example, Professor E. Mellanby,* referring to the observations of Hess and Unger, emphasises the difference in distribution of the fat-soluble factor and the so-called anti-rachitic factor in vegetable fats. He says that though cotton-seed oil is generally accepted as containing no fat-soluble A, in his

* *The Lancet*, 1920, i, 857.

experience it is one of the better vegetable oils in preventing rickets. And investigators are by no means agreed even on the presence or absence of fat-soluble A in any given foodstuff. Professor Paton, following most authorities, assumes that lard is considered vitamin-free, while quite recent work by Dr. J. C. Drummond† differentiates between lard derived from grass-fed pigs and those fed on a diet deficient in vitamins. In the former he has found fat soluble A. Incidentally Professor Paton deduces from the first experiment quoted above that for experimental purposes "dried milk may safely be substituted for fresh milk." Dr. Drummond classes their relative content of fat-soluble A as ++ and +++. Since quantitative results that cannot be expressed numerically are of doubtful value, not even the firmest adherents of the vitamin hypothesis could regard this as an important contribution to the question of the form in which milk ought to be supplied to children. We only mention it as a further sign of what an enormous mass of work yet remains to be done before the presence or absence of a vitamin from any foodstuffs, still less the ætiology of rickets, can be proved. In fact, those who are inclined to be quite bewildered by the conflicting results of different eminent observers in the same field can derive some help from a critical essay by T. B. Osborne and L. B. Mendel.‡ These authors draw attention to the contradictions existing in the literature as to the presence or absence of a fat-soluble vitamin in a given experimental diet, and are inclined to attribute the discordant results of various workers to traces of this vitamin in certain diets generally considered free from them. However, they agree with Professor Paton in emphasising that the crucial experiment in which nutritive failure ensues immediately upon giving a diet deficient in this respect has not yet been done. They might have gone even further. Until a more accurate quantitative basis of estimating vitamin content can be attained the question must remain unsolved.—*The Lancet.*

† Maternity and Child Welfare, May, 1921.
‡ Jour. Biol. Chem., 1921, 45, 277.

CANCER IN ANIMALS.

At a recent meeting of the Académie de Médecine Mr. Cadiot read an interesting paper* on the distribution of cancer in animals, utilising a number of facts and figures taken from the literature in order to draw conclusions on some of the general problems of cancer. From the fact that carnivorous and herbivorous animals show no great difference in the incidence of cancer, the author deduces that diet

* *Bulletin de l'Académie de Médecine*, 1921, No. 13, Séance du 29 Mars, 1921, p. 396.

does not constitute an important factor in the genesis of cancer. Age, in animals as in man, stands out as the predominating factor. There are, however, interesting differences in the incidence of cancer in so far as it affects the different organs, and these differences also exist between different species of animals. Thus cancer of the penis appears to be particularly frequent in horses, and according to the author occurs most frequently in castrated animals. In oxen the atrophy of the testicles, which takes place after castration by "twisting," presents a predisposing factor for the development of malignant growths, chiefly of a sarcomatous type. The author is, however, on very debatable ground when he tries to prove from the incidence of cancer in animals that chronic irritation is of comparatively little importance. He bases his argument chiefly on the assertions that cancer of the digestive tract of animals is very rare, and that in draught animals cancer of the skin does not develop in those sites where the pressure of the collar and the friction of the harness produce a chronic irritation. A glance at the tables published in the Third Scientific Report of the Imperial Cancer Research Fund entitled, "Malignant New Growths in Domesticated Mammals," shows that cancer of the digestive tract is not as infrequent as Mr. Cadiot believes it to be. And he must surely have forgotten the "horn core" of cattle in India, where a squamous cell carcinoma develops with great frequency at the root of the right horn in cattle employed for draught purposes, the right horn being used to attach the animal to the wagon. But the whole question of the relation of chronic irritation to the causation of cancer has during the last few years been raised from the slough of argument and placed on a secure basis by experiment. The work of Fibiger on the experimental production of cancer of the stomach by feeding with spiroptera, and the experimental production of cancer by prolonged painting with coal tar—first successfully demonstrated by Yamagiwa and Ichikawa, and since confirmed by Fibiger and by Murray and Woglom in this country—represent important advances of our knowledge of the origin of cancer. A grain of experiment, properly conducted, is worth at least an ounce of argument.—*The Lancet.*

VIRULENT DIPHTHERIA BACILLI CARRIED BY CATS.

ALTHOUGH the available literature on the transmission of diphtheria from cats to human beings is not convincing owing to the incompleteness of bacteriological examination, many cases have been recorded based on clinical evidence alone. Major James S. Simmons,* chief of the Laboratory Service, Walter Reed General Hospital,

*American Journal of Medical Sciences, October, 1920.

Takoma, D.G., now reports a case in which he offers bacteriological evidence of this transmission. The patient was an elderly woman who developed a fatal attack of faucal diphtheria after fondling a cat which had been ill one week before the patient's illness began. The cat was said to have had a croup cough, to have been unable to swallow food, and to have become very thin. The symptoms were at first attributed to a piece of chicken-bone having lodged in its throat. Faucal cultures from the cat and from the patient showed morphologically similar organisms, resembling diphtheria bacilli, and the virulence for guinea-pigs was the same, the organisms in both cases killing guinea-pigs six days after subcutaneous injection, but failing to produce lesions in animals previously injected intraperitoneally with diphtheria antitoxin. The cat was chloroformed and a careful post-mortem examination made. The only lesion detected was a small oval ulcer covered with a yellow-grey membrane on the upper surface of the left nasal fossa, cultures from which showed diphtheria bacilli. Throat cultures from a second cat, which had often played with the first, also showed morphologically typical diphtheria bacilli. The second cat died after eight days' confinement in a cage, and *post-mortem* showed small membranous patches, from which virulent diphtheria bacilli were isolated, on the vocal cords. The history of contact, dates of infection, and bacteriological findings suggest that the first cat was the source of infection of the patient as well as of the second cat, though, as Major Simmons admits, this cannot be proved. It is certain, however, that both cats were carriers of virulent diphtheria bacilli, and were therefore a danger to human beings.—(*The Lancet*).

THE MOVEMENT TOWARDS LIVE STOCK IMPROVEMENT.

ALTHOUGH a policy of the closest economy has been imposed upon all Government Departments, and it has been found necessary to abandon many schemes of interest and value, the policy of improving the live stock of these Islands still receives a measure of support, and for the financial year now opening (1921-1922) it has been found possible to allocate a sum of £35,000 for use in England and Wales. Of this amount £18,000 is set aside for grants for bulls, £7,800 for Milk Recording Societies, £7,250 for heavy horses and £3,000 for boars. The provision covers grants for 900 bulls, 600 boars, 100 heavy horses and for a few rams which will be used in North Wales, this last being a comparatively new experiment. The value of the grants is very considerable; it is both direct and indirect. For example, the Live Stock Scheme can claim to have led to the formation of several new Breed Societies with consequent improvement both in the class of

the animal and in the price paid for it. It is noticeable, too, that during the period when the slaughter of calves was at its height, very few calves sired by subsidised bulls went for slaughter. It was clear that those who had bred a good calf were not disposed to see it turned to veal. The mere fact that it had good parentage was sufficient justification for an effort to rear it. Then, again, there is a very brisk private market in premium sires, and although they may be bought in the first instance at quite a low figure, that figure tends to rise very considerably as soon as their worth is proved. For example, a boar bought for twenty guineas under the Live Stock Improvement Scheme was sold some time later for six hundred, while a subsidised bull sold for service in a pedigree herd sired nine bull calves which averaged upwards of five hundred guineas apiece. Figures of this kind have an eloquence that is irresistible. The heavy horse grants have been found to encourage co-operation among farmers for the hire of good class stallions, and those who know how careless the farmer was in this regard only a few years ago will admit the ample room for improvement. Quite apart from results that have in them something of a sensational element, live stock officers of the Ministry are able to record a state of general progress. For example, it is reported from one farm that the calves bred from a premium bull made £10 more per head than others born on the same farm from another sire. The possibility of securing good strains has led to the establishment of several new herds of Shorthorns in various parts of the country. In one instance, a bull bought under the Live Stock Scheme for £240 was sold for 550 guineas to go abroad, while another that cost 43 guineas under the Scheme ultimately reached the Argentine, where it fetched 550 guineas. The owner of one of the Society's bulls won first prize at the Royal Norfolk Show and has refused £250 for the animal. At the same time it is noticed that service fees are much higher than they were, and are paid without complaint for the use of registered sires.—*Ministry of Agriculture and Fisheries.*

LIGHT HORSE BREEDING : STATE ENCOURAGEMENT.

FOR ten years past the Ministry of Agriculture has devoted about £30,000 per annum to assisting and encouraging the light horse breeding industry in England and Wales. The methods adopted fall under three heads :—

(1) Licensing (formerly registration) of sound stallions to travel through the country for service on the farms.

(2) The award of premiums to the owners of those thoroughbred stallions which travel at a nominal service fee of £1.

(3) The leasing of brood mares to farmers.

It may be remembered that the Horse Breeding Act of 1918 superseded the earlier system of voluntary registration introduced in 1911. The Act of 1918 came into operation last year, when no fewer than 3,750 stallions were licensed by the Ministry. This good work is still in the initial stage and some years may elapse before the full benefit is felt throughout the rural areas of England and Wales, but it is not too early to note with satisfaction the elimination of large numbers of the unsound stallions that could be met along any country road in the late spring and early summer and were travelled profitably, for their owners, on account of the low service fees charged. It has long been a reproach against a certain class of farmer that he has been prepared to accept for his stock any sire for whose service the price was low, and the result has been that in this country where the finest animals are to be found, there is a great residue of the very worst. The Horse Breeding Act is gradually putting an end to this condition as far as horses are concerned, and those who travel an unlicensed stallion to-day commit an offence for which the penalty is not inconsiderable. All things considered the Act has worked smoothly; complaints have been few and there have been sufficient prosecutions to enable those who have no regard for the objects of the Act to realise that it is a force that must be respected. In the current estimates provision has been made for premiums to one hundred thoroughbred stallions and a number of Welsh Cobs as well as Riding, Fell, Dale, Mountain and Moorland ponies.—*Ministry of Agriculture and Fisheries.*

Clinical.

FURTHER NOTE ON HABRONEMIASIS.

By Major J. R. HODGKINS, D.S.O., F.R.C.V.S.,
Secunderabad, India.

In the *Journal of the American Veterinary Medical Association* for July, 1920, B. H. Ransom and M. C. Hall, in an article on "Parasitic Diseases of the Southern United States," discuss Habronema and make suggestions as to treatment. "As regards treatment, no adequate tests of anthelmintics for these worms in the stomach have yet been made." They go on to suggest oil of chenopodium, and carbon bisulphide might be useful.

This note is written to give the result in the hands of the writer of these drugs, and of them and a combination with subcutaneous injections with atoxyl.

An Australian gelding, eleven years old, Clydesdale cross-type of medium draught, was admitted to hospital with debility. The photograph illustrates his condition at this period. The routine tests and examinations having been made (*vide* debility card attached),

he was prepared for the vermifuge—two days on mashes, followed by thirty-six hours of fasting. (Note the loss of condition during this period, which has been found to be fairly constant in a great number of observations, viz., 20 to 30 lbs.) At the conclusion of the fasting he was given :—

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Carbon bi-sulphide	..	ʒvi
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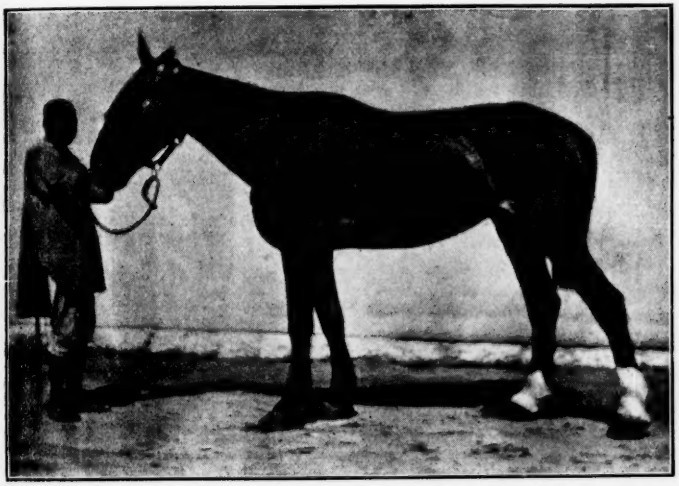
with a stomach tube. (This is undoubtedly the most satisfactory method of administration, as it absolutely ensures the animals getting the whole dose.) The result of the dose is shown in the appended card.

On the Saturday of the second week he received 60 mils. of a 4 per



cent. solution of atoxyl subcutaneously. (See this Journal, June, 1920, concerning the negative results obtained by intravenous injections of tartar emetic.) On the succeeding three Saturdays he received the same injections of atoxyl. This treatment was supplemented by light exercise, grazing and feeding, as indicated.

The growth during the period is shown in the card. It seemed to reach its maximum at the end of the fifth week and then to fade away rapidly. A furnished animal of this type should weigh 1,200 lbs.

He was cast and destroyed.

Post-mortem Examination.—All the organs were apparently healthy with the exception of the stomach. It is unnecessary to enter again into the description of lesions caused by these nematodes. (See

this Journal, June, 1920.) It is sufficient to say there were two sub-mucous abscesses—one of the size of an orange, the other of a walnut, crammed with pus alive with *H. Megastoma*. The mucous surface of the stomach was invaded by masses of the other habronemæ, very much alive and well. The assistant at the post-mortem was asked if the stomach surface reminded him of anything, and he replied: "Well, it seems to have the grain of nearly cold boiled beef." This is, perhaps, not a very exact pathological picture, but the condition had its appeal even for the layman.

DEBILITY CARD.

Unit.	No.	Date of Admission.	Probable Cause.
—	—	—	Parasitism (Intestinal).

Examination ...	Result
Mallein Test ...	Negative.
Blood Examination...	Negative.
Vermifuge Test ...	Oxyures. Strongyles.
Dental Examination	Enamel points.

Weight	Cwts.	Lbs.	Gain.	Loss.	
Admission	...	980	...	...	...
1st Week...	...	960	...	20	...
2nd ,, ...	...	980	20	...	...
3rd ,, ...	...	1,010	30	...	...
4th ,, ...	...	1,040	30	...	...
5th ,, ...	...	1,088	48	...	...
6th ,, ...	...	1,100	12	...	...

Total ... ... Absolute gain = 120 lbs.

Rations ...				Lbs per day.	
				1, 2, 3.	4, 5, 6.
Barley ...	...	...	...	2	8
Gram ...	...	...	...	2	3
Koolthi ...	...	...	...	...	...
Oats ...	...	...	...	6	...
Linseed ...	...	...	...	...	...
Bran ...	...	...	...	2	2
Dry Grass	...	...	...	20	20
Chaff ...	...	...	...	5	5
Lucerne ...	...	...	...	5	5
Guinea Grass	...	...	...	5	5

Result and Remarks	
	The loss in the first week is due to the vermifuge test.
	Received 60 c.c.s of a 4 per cent. atoxyl solution every Saturday in second, third, fourth, and fifth weeks.
	The rations of the first three weeks and the second period were as shown in the two columns.

It is, perhaps, interesting to note that there was only one bot present. It was alive. There were no other parasites obvious in the intestinal tract, so the treatment had been efficacious elsewhere.

So much for carbon bisulphide and atoxyl in the treatment of this disease. It only remains to say that the writer has had the

opportunity of making post-mortem examinations on several animals which had received

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as part of their treatment. In every case habronemæ had survived the ordeal. It thus remains to find an "adequate anthelmentic for these worms in the stomach of the horse."

THREE ANIMAL PARASITES.

By J. F. CRAIG, M.A., M.R.C.V.S.
(*Principal of the Royal Veterinary College of Ireland, Dublin.*)

(1) Ascaris Megalocephala in an Unusual Position.

On September 1, 1917, I received three specimens of the Ascaris megalocephala from Mr. H. Dolan, M.R.C.V.S., Mohil, Co. Leitrim, with the following history:—An enlargement appeared in the region of the umbilicus in a colt 15 months old. The swelling ruptured spontaneously and six worms escaped. A day or two afterwards three more worms, the specimens which were forwarded to me, were removed by Mr. Dolan. The colt was at first dull, not feeding properly, and had a temperature of 103° F. The swelling was fomented once daily with 1-1,000th solution of corrosive sublimate. It rapidly decreased in size, the dulness disappeared, and the animal began to feed well. In about fourteen days the swelling had altogether subsided and the colt had completely recovered. The three ascarides were 14.5, 14.5, and 18.7 c.m. long respectively, and proved to be adult males. The remarkable feature of the case is the most unusual position occupied by these worms, and I have not come across a record of a similar nature. The presence of the worms in the umbilical region is not easily accounted for. Judging by analogy from the route taken by Ascaris Lumbricoides, as described by Stewart and Ransom (*a*), one might suppose that the worms migrated from the bowel as larvæ and became side-tracked under the peritoneum in the umbilical region, and there they reached the adult stage, causing the enlargement from which they afterwards escaped. In any case, whether they left the bowel as larvæ or as adults, the breach in the intestinal wall must have been very slight and rapidly repaired. There did not appear to be any continuity between the lumen of the bowel and the swelling, no intestinal contents issued with the worms, and the subsequent rapid recovery of the animal is also opposed to that view.

(2) Larvæ of Warble Flies in the Horse.

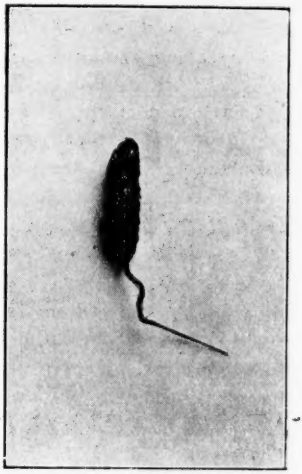
It has been held by Joly (*b*) that the larvæ found in warbles met with in the horse belong to a separate species of hypoderma, although

the adult fly has not been reared out from the maggots. Railliet in France, and Mégnin, identified some specimens as the larvæ of the Hypoderma bovis in the penultimate stage. I was able to secure two batches of larvæ during the past few years, one taken from a military horse and the other from a four-year-old dun pony treated in the clinique. The latter animal had about a dozen warbles scattered over the sides of the abdomen and thorax and the back and loins. They were about the size of hazel nuts, fairly well defined, and not very painful. The hair over them had become agglutinated with a glairy, yellowish-white pus, which had evidently escaped through a small opening at the summit of each of the swellings. After enlarging ne openings a small maggot, together with some pus, was squeezed out of each of the warbles. These larvæ were whitish in colour, somewhat spindle shaped, with blunt extremities; they varied in length from 12 to 15 mm., and were provided with a thin almost transparent cuticle. They differed from the larvæ of the horse warble described in "Neumann's Parasites" (*c*) amongst other things by the possession of spines on the rings. Prof. Carpenter, D.Sc., Royal College of Science for Ireland, Dublin, examined these specimens for me and identified them as the third stage larvæ of one of the Hypoderma of the ox, whether Hypoderma bovis or lineata he was unable to state. It is quite possible that if the larvæ in the warbles of the horse were more generally examined, the Ox Hypoderma might be found to be the only, or at least the chief, fly responsible for the production of warbles in equines. That the larvæ were only third stage larvæ and had not attained maturity might account for the failures previously experienced in raising the adult fly from the maggots.

(3) Rat-tailed Larvæ.

During the past few years several specimens of rat-tailed larvæ have been forwarded to me with the information that they have been passed in the fæces of cattle. Two of the batches came from Co. Leitrim and Co. Mayo. In each instance there was a definite assurance that the larvæ were present in the fæces at the time of defecation, and had, therefore, presumably traversed the alimentary canal. The photograph shows their main features. They are remarkable for the possession of a long, extensible anal breathing tube, which is arranged almost like a telescope at the posterior extremity of the body. When the larva is swimming about in fluid the end of this tube projects above the surface of the medium. The specimens I have vary in length from 20 to 45 mm., and the breathing tube is as long as, if not longer than, the body. The specimen in the photograph measures 45 mm. in length and the breathing tube 25 mm. The flies of which these are the larvæ belong to the family of Syrphidæ, and are commonly

called Drone flies. The Eristalis tenax (*d*), the drone fly, resembles the drone bee in appearance, and feeds on the nectar of flowers. It deposits its eggs on liquid manure, and there the larvæ hatch out and develop. They may pass readily into pools, ditches or streams subject to sewage contamination, and thus cattle may occasionally pick them up in the drinking water. In only one of the cases from which the specimens came were any symptoms noted which could



Rat-tailed Larva.

be attributed to these larvæ. In this case the ox was stated to have become affected with colic, was uneasy and restless, constantly lying down and rising again, but still feeding. A purgative was administered and several larvæ passed in the fæces. The symptoms then disappeared. It is interesting to note that the human subject has also occasionally been found to afford a temporary residence to rat-tailed larvæ.—*Department of Agriculture and Technical Instruction for Ireland.*

REFERENCES.

(*a*) "Life History of Ascaris Lumbricoides and Related Forms." R. H. Ransom and W. D. Foster. *Journal of Agricultural Research*, Vol. XXI, No. 8. November, 1917.

(*b*) "Traite des Zoologie Medicale et Agricole." A. Raillet; 2nd edition, 1895; page 772.

(*c*) "Parasites and Parasitic Diseases of the Domesticated Animals." Neumann-MacQueen. 2nd Edition, 1905; page 50.

(*d*) "Medical and Veterinary Entomology." W. Herms. 1915, page 244.

FOREIGN BODIES IN A BULL'S RUMEN.

By W. WALLIS, M.R.C.V.S.
(*Barnet*).

THAT cattle will swallow foreign bodies is well known, but the size and weight of them is often unbelievable unless they are absolutely seen.

A short time ago I was called in to give an opinion upon a bull, which, the owner said, was not "doing well." I diagnosed this to be due to indigestion from the presence of foreign bodies in the digestive tract, but I was hardly prepared for what I found on post-mortem examination. With the owner's consent the animal was destroyed, and the contents of the rumen included two large iron wedges used for splitting wood and a collection of iron bolts, nuts and screws numbering over a hundred. Upon enquiring into the history I found that the owner had been repairing the mansion and premises, and that a barn had been used as a workman's shop in which a lot of carpentering and ironwork repair had been done. The bull had had free access to this barn and had from time to time swallowed the foreign bodies.

URTICARIA IN A COW.

By MAJOR C. G. SAUNDERS, D.S.O., B.V.Sc., M.R.C.V.S.
(*Worthing*).

RESPONDING to an urgent call to visit a cow, whose owner was convinced that she was very seriously ill, but who could give no coherent description of her condition, I found a half-bred Shorthorn cow, lately calved, suffering from a typical case of urticaria. The body, udder, vulva and perinæum being covered with varying sized wheals, no constitutional symptoms and no cause could be found for the attack, as she had been in the pasture with the rest of the herd. A saline purgative restored her to normal, much to the owner's relief.

ORBITAL SINUS.

By J. H. MASON, M.R.C.V.S.
(*Darlington*).

Subject.—Second season foxhound dog.

History.—For several days the left eye had been "discharging," but this was considered by the huntsman to be due to the hound having caught a cold in that member, or to some foreign material adhering to the cornea. No history of a blow in the region of the orbit was given.

Symptoms and Treatment.—A cursory examination led me to think that it was a case of muco-purulent conjunctivitis. The conjunctiva was smooth and congested and the cornea semi-opaque. Photophobia was manifested by half-closed lids and unless a closer inspection had

been carried out, the case would have been dismissed with a bottle of eye lotion. However, with no little trouble I discovered what I only half hoped to find—a sinus extending from the inner canthus to about two inches up the frontal bone. It commenced just underneath the upper lid and ran upwards below the skin. As daily treatment was necessary, the case was transferred to hospital.

After fixing the animal and locally anæsthetising the eye and adjacent skin (with " Apothesine "), I passed a probe to the blind end of the sinus and made an incision at that point. With a fine seton needle I introduced a tape and tied it in position, but, unfortunately, the hound pulled this out during the night.

Daily syringing of the sinus with " Eusol " and irrigation of the eye with zinc lotion (4 grs. $ZnSO_4$ to 1 oz. of water) brought about an improvement, but still the discharge did not cease. As the passage showed signs of closing too soon (due to absence of seton), I smeared a piece of tape with " protosil ointment " (a silver nitrate preparation) and introduced it for a few minutes. It had the desired effect of widening the sinus.

About three weeks after admittance to hospital, two small fragments of bone were noticed at the inner canthus and the smaller of these I succeeded in removing at once. The other remained firm and caused the animal some pain when traction was applied, but after allowing three or four days to elapse I successfully removed a sequestion, the area of which was about that of a shilling. It was an elongated fragment, the ends of which were firmly held by the upper and lower lids so that it had to be screwed round before coming away.

The eye now made an uninterrupted recovery : discharge ceased at once : sight was restored and except for a rather drooping upper lid the hound was normal.

This case shows how a minute examination pays ; I might have treated the eye for conjunctivitis for long enough and eventually (with the exfoliation of the fragments) been made to look very small.

FATAL POISONING BY SMALL DOSES OF OIL OF CHENOPODIUM.

By T. G. PRIME, M.R.C.V.S.,
Upper Norwood, S.E.

I HAD until recently looked upon oil of chenopodium as a safe vermicide, but, alas ! find that, like santonine, it is by no means safe any more than absinthe is.

Two cats, aged about seven months, were each given a capsule containing two and a half drops of oil of chenopodium and half-an-hour afterwards a dose of salad oil. In about an hour's time one cat was sick and suffering from abdominal pain and twitching. These

symptoms continued at intervals for about eighteen hours, when the cat died. The other cat was sick, suffered from slight abdominal pain and twitching, and remained dull and stupid for three days before recovering its health.

A fox-terrier puppy, aged eight weeks, which was apparently healthy at the time a dose of two and a half drops of oil of chenopodium in a capsule was given, and a small dose of castor oil half-an-hour afterwards, was taken seriously ill half-an-hour afterwards, rolling about and screaming with pain. Eyes rolling and showing a great deal of the whites. At times there were epileptical convulsions, with peaceful intervals. The puppy was very limp and lifeless at times, and gradually the respirations became less frequent and shallow, and the puppy died twelve hours after the dose was given.

The symptoms in both these cases were the same as if an overdose of santonine had been given, the only difference being abdominal pain.

I cannot find a case of fatal poisoning by oil of chenopodium recorded, although there are plenty by santonine.

A NEW VARIETY OF RINGWORM

By ROBERT CRAIK, M.D.,
Glasgow.

A HEALTHY girl, aged 21, had in October, 1916, a skin eruption on her thigh. It began a fortnight before as a small red point which was thought to be a bite, and was now about the size of a shilling and quite suggestive of ringworm. Fine scales showed plenty of mycelium. The source of infection remained unknown. Treatment was soon successful.

Seeded on wort agar fine particles gave good growths. At first grey and semi-transparent, after the sixth day, at room temperature, a white floury centre appeared and spread over most of the culture. In plate cultures this centre, under a low power, was a forest of upstanding, large, rough, multiseptate spindles; and the peripheral zone showed matted mycelium with a smooth surface on which were a few scattered small spindles and a few simple, attentuated, sterile, aerial hyphæ. Under a higher power (16 in.) a slide preparation showed pyriform swelling at the septa in several hyphæ; many large spindles were seen to have 6-9 septa and thick walls conspicuously rough on the outside. Repeated culture on several media at various temperatures gave no material change except in rate of growth.

1. The pyriform swellings at the septa, even in young cultures, are characteristic of microsporon.

2. The floury centre contrasts with the downy centre of *M. audouini.* Microscopically total absence of acladium conidiophores explains

this, for these are abundant on all media in microsporon of the child, and form the white down on its cultures. The multitudes of coarse spindles forming the floury centre are not present in microsporon of the child, which is remarkable for scarcity of little divided spindles.

3. In microsporon of the dog large spindles are fairly numerous, but its cultures also bear numerous acladium conidiophores—one is as important as the other. Under stress of circumstance the new organism has completely scrapped the primitive acladium conidiophore and staked its existence on multilocular spindles, which it produces in countless numbers.

The microsporons are usually regarded as one species, *M. audouini*, with two varieties—*M. audouini* var. *canis* and var. *equinum*. Obviously var. *canis* is only half-way between *M. audouini* and the new variety which deserves the name var. *macrosporium*. This plurality of conidial forms in microsporon, these elaborate multilocular spindles and the constantly hall-marked mycelium, are reminiscent of certain higher ascomycetes. Under pathogenic conditions such forms are never seen. It is to be inferred that such an organism, growing well on ordinary media at ordinary temperatures and passing through a parasitic phase in which development is much restricted, leads a double life in nature for which the conidial forms are designed. —*The Lancet.*

ACUTE GASTRIC INDIGESTION IN A PIG.

By MAJOR C. G. SAUNDERS, D.S.O., B.V.Sc., M.R.C.V.S.
(*Worthing*).

A THREE-MONTH-OLD male pig developed acute symptoms of indigestion very shortly after he had eaten his own share and his three brothers' shares of raw potato peelings. He showed great restlessness, squealing and grunting, with short periods of quiescence, abdomen greatly distended and tense.

Treatment.—Copious enemata of soapsuds emptied the rectum and colon, which gave only slight relief. As it was found impossible, owing to the resistance of the patient, and his apparent inability to swallow, to administer any remedies *per orem*, apomorphine grains $\frac{1}{8}$ was given hypodermically. About ten minutes afterwards the patient was seized with what appeared to be an epileptic fit, sudden unconsciousness, foaming at the mouth, and convulsive movements of the limbs. From this seizure he rapidly recovered, and in few a minutes had a copious evacuation of fæces and flatus, but vomition did not occur. Very shortly after the action of the bowels the patient, who had regained his normal figure, was hunting around for something to eat and making an uneventful recovery.

INVAGINATION OF THE SMALL INTESTINE IN A ROMNEY MARSH RAM AND ITS PROBABLE CAUSE.

By E. MORGAN, M.R.C.V.S., D.V.H.,
Puerto Cabello, Venezuela.

THIS two-year-old imported pedigree sheep had been under my care for several months. It arrived in this country from England last August, along with a few others. Last November the animal suffered a great deal from what we might term " spasm of the bowel," which caused frequent motions. The fæces expelled were a great deal softer than normal. The animal forced so much at times that several inches of the rectum appeared. In spite of all this he continued eating moderately well. He was coughing deeply sometimes, if disturbed. The animal moved with a stiff gait in the hind parts of the body, and at times was quite lame in one of the hind limbs, yet I could not detect anything abnormal throughout the length of the limb. Besides, there was not the least manifestation of pain while I manipulated the limb. Eventually I noticed that he got into the habit of eating the walls of the buildings, which consist chiefly of dried mud. This habit is quite common throughout the interior of the country amongst herbivorous animals, and sometimes amongst human beings. Grown-up children are known to have eaten holes through the walls of their bedrooms. Doctors find it difficult to cure. Perhaps those who chew tobacco can enlighten us on the subject. These persons are pale yellow in colour and anæmic.

As I could not easily prevent the animal from eating these walls and allowing him liberty like the others, I placed him in a loose-box of concrete walls and gave him small quantities daily of pulverised bone to try and counteract the habit of eating abnormal substances, a treatment suggested by Sir Arnold Theiler in Africa. While indoors I found that the animal voided a few worms in the fæces, so I treated him with copper sulphate and gentian, as well as tonics. Also a few enemas of a weak solution of potassium permanganate. In about a fortnight's time I liberated the animal, as he was now eating well, and *the intestinal* spasms had disappeared, as well as the lameness, with the exception of a slight drag on the hind limbs, which continued till death. Although his appetite was good, yet he did not improve proportionately in condition. After the lapse of several months he recently commenced again to eat the walls, as well as earth in the fields. Although the digestion was impaired, the intestinal trouble was not so pronounced as before. One day this week he did not follow the others to the field, but stayed behind in the yard. The following day I noticed these symptoms :—Absence of rumination ; stoppage of the bowel, and hardly any attempts to pass fæces. Although the animal was evidently in

pain, yet he was resting without the least outward manifestation of colicky pains. Eyelids half closed and drooping ears. It needed a great deal of persuasion to get him on his feet, and then he would move about a little, but would soon lay himself down again. I should like to emphasise that ruminants *with intestinal obstruction*, as a rule, will only get on their feet by forcing them to do so. This is one of the typical symptoms of " gut tie " in steers. Temperature was only a shade above normal.

Treatment.—I can dismiss with a few words. Gave him a small dose of linseed oil, plus a few drops of tincture of aconite, which he vomited immediately. He expired in about an hour's time. This dose, I think, hurried matters.

Post-mortem Examination.—The large intestine, as well as several feet of the small intestine, were studded with nodules of various sizes from a pea to a walnut, also the mesentery itself to such an extent that there was hardly an inch of the latter without large nodules, which appeared like casefying tubercles [these nodules are said to form ports of entrance for numerous pathologic bacteria—Sub-Editor] of a diseased bovine pleura, with at least one difference, that the contents of these were of a greenish-yellow colour, which contained larvæ of nematode worms, apparently *æsophagostoma Columbianum*, which are often met in the intestines of American sheep and cattle, and make the intestines of slaughtered animals unfit for sausage casings. I have often condemned barrelsful of casings due to these verminous nodules. In this particular case the mesentery and the last part of the intestine were the most highly infected areas. There was an invagination of about ten inches of the small intestine, which was highly inflamed, and the parts were so firmly set in that position that I was obliged to dissect a few inches of the outer invaginating portion before I could withdraw the invaginated portion. The stomach and also the intestine as far back as the invaginated part were full of food, which was of normal consistence, with the exception that it contained a quantity of earth. All other organs appeared healthy.

Remarks.—Two or more conclusions can be drawn from this case, of which either or both might have been the direct or indirect cause of this invagination of the intestine :—(1) The worm nodules. (2) Eating earth. Both of these caused irritation of the intestinal wall. Also the extensive nodules were apt to cause contraction of the intestine at certain areas. Their presence caused spasms of the intestine, with the result of so often expelling its contents that when the contents of the stomach would pass backwards along the almost empty contracted coil and came in contact with these studded areas it was quite easy for the inversion to take place during a spasm.

These worm nodules were undoubtedly the cause of lameness and the stiff gait of the animal. Animals are apt to eat irritant poisonous materials along with the dried mud in these walls.

In a case of *intestinal* obstruction one might ask the question: Why such a vast difference in symptoms between ruminants and equines? Is it due to the difference in size and functions of the two stomachs? Evidently there is less digestion going on in the ruminant's intestine than in the equine's. There is a continuous flow of bile into the intestine of the horse, which helps to explain that the food passes out regularly from the stomach to the intestine. Also the stomach of the horse is too small to retain a large quantity of food, unlike the ruminant's stomach. Also the ruminant, not being a continuous feeder, is supplied with a large gall bladder, so as to store sufficient bile until needed. Intestinal trouble is far more acute in equines than in ruminants.

Translations.

SWINE ERYSIPELAS IN MAN.

By J. SABRAZES and L. MURATEL.

The authors refer to a case of erysipelas observed in man, due to accidental inoculation at the time of vaccinating swine. The operator accidentally stabbed himself with the needle of a syringe filled with vaccine against erysipelas. The needle was introduced into the index finger of the left hand to a distance of two millimetres. The first symptoms of erysipelas appeared four days later, nothing having been applied at the time, except a spot of tincture of iodine to the site of the inoculation. Bichloride of mercury 1 in 1,000 was now applied and proved very effective, but if the application was suspended for a period erysipelas showed a tendency to reappear. The blood of the lesion sown on special culture media showed no bacilli; it revealed on microscopic examination very rare bacilli of the erysipelas type and contained a larger proportion of white globules than the blood of healthy skin. In the general circulation there was a larger percentage of eosinophile bodies (4.64 per cent.)

Terminating this brief note the authors recommend the systematic use, topically, of the bichloride immediately after the infecting prick, and that the dressing be maintained *in situ* permanently during the whole of the period of incubation, which is about four days.

(This note is interesting in view of the fact that one or two British practitioners have mentioned cases of accidental infection with swine erysipelas.—Sub-Editor.).—*Revista Zootechnica.*

G. M.

FOOT AND MOUTH DISEASE IN MEN AND ANIMALS IN OLDENBURG.

By SCHLÄGER.

SCHLAGER has tabulated the results of the enquiry by the Oldenburg doctors into cases of illness in which the transmission of foot and mouth disease to men has been established. Altogether 60 such cases are mentioned. Severe cases of illness have often been treated in which there was great general disturbance of health and typical signs of the disease in the mouth, on the hands and on the toes, which compels us to a knowledge that the virus of foot and mouth disease can certainly be transmitted to man. Modes of communication are through uncooked milk and also by direct contact with the virus. As proof of the identity of the malady in man and animal inoculating material from sick men has been introduced into experimental animals with positive results. The susceptibility of man to inoculation does not, however, appear to be very great, as during the period under discussion (1920) the disease was notified in over 10,000 holdings.—*Swiss Veterinary Journal.* G. M.

SUBCUTANEOUS INJECTIONS OF SALICYLATE OF SODA.

By LHOSTE

AFTER remarking on the use of salicylate of soda in the treatment of acute archronic rheumatism, on the inconvenience of its administration by the digestive tract and on the difficulty of its use in veterinary medicine owing to its high price, the author advises its use subcutaneously.

He relates two cases of cure, the one in a cow and the other in a horse, by means of hypodermic injections of the following solution :—

Salicylate of soda	..	30 grains.
Distilled water	..	160 minims.

The injections are repeated for 5 days and at the end of 8 days cure is complete.

Any complication, such as œdema at the point of inoculation, may be easily avoided by using a less concentrated solution. Lhoste suggests the use of this method as a preventive in infectious rheumatism of young animals and in arthritis following abortion and post partum metritis.—*La Presse Medicale.*

G. M.

Abstract.

A NOTE ON SURRA IN CAMELS FOR COMMANDANTS OF CAMEL CORPS.

By H. E. CROSS, M.R.C.V.S., D.V.H., A.Sc.

Treatment.—The treatment with which the best results are obtained is by the intravenous injections of 1 per cent. solution of tartar emetic on alternate days. An average sized camel tolerates the following doses :—

1st day—50 c.c. of a 1% solution. One day interval.

3rd day—100 c.c. of a 1% solution. One day interval.

5th day—150 c.c. of a 1% solution. One day interval.

7th day—150 c.c. of a 1% solution. One day interval.

9th day—200 c.c. of a 1% solution. One day interval.

11th day—200 c.c. of a 1% solution. One day interval.

13th day—200 c.c. of a 1% solution. One day interval.

15th day—200 c.c. of a 1% solution. One day interval.

17th day—200 c.c. of a 1% solution. One day interval.

19th day—200 c.c. of a 1% solution. One day interval.

21st day—200 c.c. of a 1% solution. One day interval.

23rd day—200 c.c. of a 1% solution. One day interval.

25th day—200 c.c. of a 1% solution. One day interval.

27th day—200 c.c. of a 1% solution. One day interval.

29th day—200 c.c. of a 1% solution. One day interval.

31st day—200 c.c. of a 1% solution.

The first injection should be given when trypanosomes are absent from the peripheral circulation and the temperature is low ; if the drug is injected during a paroxysm, fainting and in some cases even death may result from comparatively small doses, *e.g.*, 50 c.c. of a 1 per cent. solution ; but if the injection is made when the peripheral circulation is free from trypanosomes, doses up to 200 c.c. of a 1 per cent. solution are usually well tolerated.

The tartar emetic should be dissolved in distilled water ; the solution filtered and injected very slowly at blood heat. Freshly prepared solutions must always be used.

The most suitable apparatus is Ehrlich's injection flask, fitted with indiarubber tube, glass tube and needle.

If any of the solution is injected subcutaneously swelling and suppuration will result.

When the needle enters the vein the blood will be seen in tube A. The dose of tartar emetic is then poured into the flask B. The indiarubber tube must now be squeezed to get rid of any air. The solution is allowed to flow into the blood stream, and when nearly the whole

of dose has entered the blood a little normal salt solution is poured into the flask B and allowed to flow into the blood stream, the needle being then withdrawn.

If no salt solution is injected after the tartar emetic a drop of the latter may enter the tissues when withdrawing the needle, resulting in suppuration and swelling, but by the injection of a small quantity of salt solution after the tartar emetic this danger is avoided.

If after any injection the camel is off feed no further injection should be given till the camel is again feeding well, and the next dose should be slightly decreased. If the decreased dose is well tolerated, a full dose may then be given at the next injection.

The doses must therefore be regulated in accordance to the manner in which camel is "standing" the injections.

The best way to determine how the camel is "standing" the injection is to note how the animal feeds. The injections should be made in the afternoon. The camel should be fed in the morning with a small quantity of grain, then sent out for exercise or browsing, and again fed with grain and bhoosa in the evening. Water should be allowed *ad lib.*

During the course of the treatment, if the camel becomes constipated he must be treated with Epsom salts, in doses of 1½ to 2 lbs. Sometimes diarrhœa (occasionally bloody diarrhœa) results from the injections of tartar emetic. In such cases 2 to 3 ozs. of chlorodyne or camphorodyne should be given, and no further injection should be given till the condition of the bowels is normal. In some camels quivering of the muscles of the hindquarters a few hours after the injections is given is observed, but this symptom disappears after a few hours and needs no special treatment.—From the REPORT OF THE DIRECTOR OF AGRICULTURE, PUNJAB.

AUSTRALASIAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE fifteenth meeting of the Australasian Association for the Advancement of Science was held at the University, Melbourne, during the week commencing January 10, 1921.

Though these meetings generally are held every two years, owing to the war and the impossibility of gathering scientists together a period of seven years had elapsed since the last meeting.

During this time, however, the parent Society—the British Association—held a meeting in Australia in 1914. The present meeting was to have been held in Hobart, Tasmania, but, owing to the shipping

difficulties consequent on a strike, it had at the last moment to be transferred to Melbourne.

As with the parent Association, all branches of science are represented, there being in all thirteen sections. Previously veterinary science had occupied a sub-section of agriculture, but to veterinary science has now been allocated a full section.

The officers of this section were :—President, Professor H. A. Woodruff (Melbourne) ; vice-presidents, Professor J. Douglas Stewart (Sydney), Dr. J. A. Gilruth (Melbourne), and Mr. Max Henry, B.V.Sc. (Sydney) ; committee, Dr. W. T. Kendall, Messrs. W. A. N. Robertson and C. N. Meyers ; secretary, Mr. T. Philip, L.V.Sc., Hobart, who carried out the initial organisation, but owing to his inability to come to Melbourne Dr. H. R. Seddon subsequently undertook his duties.

The Congress as a whole was very well attended, and thoroughly successful.

Naturally, owing to the sudden transfer to Melbourne, it was not possible to arrange as many excursions as might have been wished. The Section of Veterinary Science was very well attended, not only by veterinarians resident in the State of Victoria, but also by a number from New South Wales and South Australia. All members, however, are eligible to attend the meetings of any of the sections, and this privilege was freely availed of by veterinarians, especially when somewhat allied subjects were being dealt with in other sections.

For his presidential address, Professor Woodruff took as his subject " The Development of the Present Conception of Immunity."

Joint discussions were held with the Agricultural and Sanitary Science Sections on " The Repression of Animal Tuberculosis," the subject being opened by Professor Douglas Stewart ; another subject discussed (with the Biological and Agricultural Sections) was " The Present Position of Theories of Heredity," the subject being opened by Professor W. E. Agar.

Members of the Section also discussed " The Prevalence of Contagious Diseases in Australia and the Danger of Introduction from Abroad."

A joint discussion was also held with the Sanitary Science Section on " Milk Production " and " Meat Inspection," the subjects being opened by Mr. W. A. N. Robertson (C.V.O., Melbourne) and Mr. Max Henry (Government Veterinary Officer, Sydney) respectively.

Papers were contributed by Mr. G. G. Heslop, M.V.Sc., D.V.H., on " Researches into the Serological Diagnosis of Pleuro-pneumonia in Cattle "; Mr. F. E. Place, B.Sc., M.R.C.V.S., on " Milk Vitamines in Diet Deficiency Diseases in Live Stock ; " and Dr. H. R. Seddon on

"The Problem of Abortion Disease of Bovines" and "A Record of the Occurrence of Bacillary White Diarrhœa of Chicks in Australia."

Owing to the non-receipt of another paper (due to shipping disorganisation) Dr. J. A. Gilruth kindly came forward and addressed the Section on "The Methods of Control and Eradication of Ticks in U.S.A. and their Applicability in Australia."

It will be seen from the above that the subjects brought forward were sufficiently comprehensive to interest members in every field of veterinary science. Admirable discussions resulted, and everyone felt the benefits of such a meeting, which allowed not only a free exchange of ideas, but the making (or renewing) of friendships with veterinarians from the other States, so helping to weld together the profession in Australia.

Parliamentary.

STATUTORY RULES AND ORDERS,

1921, No. 42.

MINES.

Coal Mines.

ORDER OF THE BOARD OF TRADE, DATED JANUARY 1, 1921, UNDER SCHEDULE 3 TO THE COAL MINES ACT, 1911 (1 & 2 GEO. V, C. 50), PRESCRIBING MANNER OF TESTING HORSES FOR GLANDERS BEFORE BEING TAKEN UNDERGROUND.

In pursuance of the Third Schedule to the Coal Mines Act, 1911, and of the provisions of the Mining Industry Act, 1920, (*a*) the Board of Trade hereby prescribe that horses before being taken underground shall be tested (*b*) for glanders by a duly qualified veterinary surgeon in the following manner:—

(1) The test shall consist of the hypodermic injection of mallein, followed by the taking of the temperature of the animal at the 6th, 9th, 12th, 15th and 20th hours respectively after the injection, but may be combined with any supplementary test.

(2) The animal to be tested shall rest for 24 hours before the test is applied.

(3) The physiological variation of the animal's temperature shall be noted before the test is applied.

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(4) The test shall not be applied to any animal while showing an abnormal temperature.

(5) The animal shall not be worked for a period of 30 hours after the injection.

(6) The test shall not be applied to any animal which, after making reasonable inquiry, the veterinary surgeon knows to have received a mallein injection within the preceding month.

(7) The mallein used for the test shall be obtained from the Royal Veterinary College, and shall be used in the dose specified by the College.

The Order dated May 17, 1912, (*c*) made by the Secretary of State in pursuance of the Third Schedule to the Act is hereby revoked.

W. C. BRIDGEMAN,
Secretary for Mines.

Mines Department,
Victoria Street, S.W.1,
January 1, 1921.

NOTICES.

All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C.2. Telephone: Gerrard 4646. Telegrams: "Baillière Rand, London."

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